HRU ECO 4

User manual

WARNING

- Do not use this appliance for functions other than those described in the booklet
- After removing the appliance from its packaging, ensure that it is complete and undamaged. If in doubt contact Itho Ventilation Ltd. Do not leave the packaging within reach of children or the infirm.
- Certain fundamental rules must be observed when using any electrical appliance, including a) never touch appliances with wet or damp hands;
  b) never touch appliances while barefoot;
  c) do not allow children to use the appliance without supervision; d)supervise infirm persons when using the appliance.
- Store the appliance out of the reach of children and infirm persons if you decide to disconnect it from the power supply and no longer use it
- Do not operate the appliance in the presence of inflammable substances or vapours (alcohols, insecticides, petrol, etc).

CAUTION

The following general instructions are important:

- Follow the safety instructions to prevent fan damage and personal injuries.
- Maintenance instructions must be followed to prevent damage and/or excessive wear and tear.
- The specifications in this manual may not be modified.
- The fans may not be modified.
- The motor module is only suitable for a 230 V 50 Hz a.c system.
- Do not expose the appliance to the weather (rain, sun, etc).
- Do not place objects on top of the appliance.
- Regularly inspect the appliance for visible defects. If any faults are found, contact Itho Ventilation Ltd. immediately.
- The appliance must only be installed by a professionally qualified person.
- Ensure that the electrical system to which the appliance is connected complies with applicable standards.
- Use a multi-polar switch with a minimum contact gap of 3 mm to install the appliance.
- Switch of the appliance at the main switch:
  a) if the appliance does not function correctly;
  b) before cleaning the outside of the appliance;
  c) if the appliance is not to be used for any length of time.
- Be careful to avoid damaging the electric circuit.
- Do not use the appliance to control activation of water heaters, room heaters etc., nor should it discharge into the flues of any such appliances.
- Ensure that the appliance discharges into a single duct (dedicated to this product) which is routed to the outside.
- The air to be extracted from the dwelling must be clean (i.e. free of grease, soot, chemical and corrosive agents, explosive or flammable mixtures).
- Keep the appliance intake and outlet grilles free to ensure optimum airflow at all times.

Electronic components

The HRU ECO 4 contains parts which may be live. Consult a professionally qualified installer in the event of an alleged fault. All repairs and maintenance work should be carried out by a professionally qualified installer.

Maintenance

The ventilation unit should be inspected regularly for contamination. Electrically discharge the unit before carrying out any work on it. First isolate the unit from the mains supply and make sure that the unit is not re-connected to the supply plug is not reinserted in the socket by yourself or anyone else before you have completed the work.

Rotating parts

The HRU ECO 4 contains rotating mechanical parts. These parts will keep on turning for a few seconds after disconnecting the unit from the supply. For this reason wait at least 10 seconds after isolating the product before opening the unit. The fan will not be moving after these 10 seconds have elapsed.

Sharp edges of the ducts

The valves and grilles in your home should also be cleaned regularly. These can be removed from the wall or ceiling. Beware of protruding duct sections. These can be very sharp.

Replacing the valves and grilles

The valves should always be placed back in their original locations. Do not turn the valve during the cleaning process; or make sure to mark the setting before cleaning the valve. If the valves are switched or set differently, the ventilation volumes will no longer be correct and the ventilation system will not work optimally. The bathroom may then remain humid for too long, your toilet may be very cool or your kitchen may smell mouldy.

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Why use balanced ventilation?

Ventilation is necessary

In the past people built houses which were not air-tight, which leaked air, for example, at the connection point of the wall and the floor or roof. Cracks were always visible around windows and doors. All these openings ensured that large volumes of air moved in and out of the buildings. When the wind was blowing the complete air content of the home was refreshed three to four times an hour. This ensured very good ventilation of the home, but a lot of energy was lost.

Construction methods have changed. Floors, walls and roofs are, when possible, constructed with a layer of insulation. The insulation ensures that there are nearly no cracks and the air-tightness is increased. It is a misconception to think that there is still enough ventilation in a home without some type of ventilation system. Ventilation is absolutely necessary in an air-tight home to prevent problems related to humidity, mould and the health of the residents.

Moisture content of the home

Incorrect use of the ventilation system by the resident in combination with today's well-insulated homes gives humidity an open field. The moisture content in the homes increases and can cause health, humidity and mould problems. A family of four persons produces 14 to 20 litres of moisture per day just by breathing, sleeping, cooking, washing, dishwashing, bathing, watering plants, etc. Many products, such as textile, carpets, parquet, newspapers and cigarettes, contain substances that harm the health of the residents. All the moisture such as water vapour and aromatic substances should be removed from the homes.

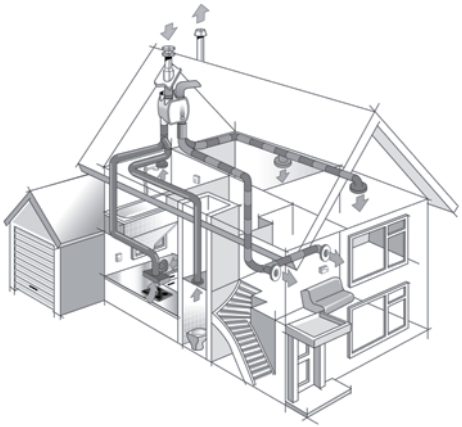
Ventilation requires energy. The correct use of the ventilation system can limit energy loss as much as possible.

Your home has a Itho Ventilation Limited supplied Itho balanced ventilation system with heat recovery. This system can contribute extensively to a healthy interior climate and an optimum comfort level. Another advantage is that the electricity costs are lower than that of any other ventilation system. The balanced ventilation system can, however, only function correctly when used and maintained in a responsible manner.
Some data:

- 5 to 20% of people have an airway disorder.
- The number of house dust mite has increased a hundredfold in the past 25 years.
- The number of people suffering from Chronic Non-Specific Lung Disease has doubled in the last 15 years.

Research has proven that fighting moisture in homes greatly contributes to the decrease of allergic reactions of people with an airway disorder. The correct use and maintenance of your balanced ventilation system makes this possible!

Operation of the balanced ventilation system



The central unit of the balanced ventilation system in your home is the HRU ECO 4 (heat recovery unit). This unit has two motors. One motor for air extraction and one for air supply.

Air is extracted from the kitchen, bathrooms, en-suites, utility rooms and toilets and, if required, from a storage room.

Air extraction and air supply

The contaminated air is filtered and fed through the heat exchanger before it is discharged outside. The fresh outside air is also filtered and fed through the heat exchanger before it is allowed into the home. Two air flows are led alongside each other in the heat exchanger (the air flows are, therefore, not intermingled). Thus, energy is saved as the heat of the discharged air is transferred to the fresh air intake. The air flows through the ventilation ducts to the bedrooms, living room and, if required, the hallway, i.e., every room with an intake grille.

Optimum efficiency

The heat exchange is highly efficient. Approximately 95% of the discharged warmth is reused within the home on average. The heat loss is, therefore, only about 5%.

> Notwithstanding the heat exchange, which preheats fresh outside air, the balanced ventilation system should not be seen as a heating system. It is a ventilation system that contributes to the comfortable and healthy climate of your home.

Overflow protection

The installation design assumes there is a 1.5 cm space between the bottom of all internal doors outside door and the floor covering. If the floor covering is thicker, the doors should be shortened.

4.1 Bypass

The Itho heat recovery unit HRU ECO 4 is delivered as standard with a bypass valve. This valve is completely integrated in the unit and ensures that, if required, the fresh outside air flows directly to the air supply system instead of through the heat exchanger. In this case there is no heat transfer between the warmer discharge air from the home and the colder intake air that is drawn into the home. The fresh outside air is blown directly into the home. This is definitely an advantage in the summer, when the outside air is often cooler than the air within the home.

4.2 Frost protection

The unit includes, as standard, frost protection. This protection ensures that the unit does not freeze during the winter. The frost protection consists of a unique frost valve integrated at the top of the unit. The frost protection is fully automatic.

Frost protection operation

In the heat recovery unit the fresh (colder) outside air is partly heated by the air discharged from the home. The exchange of heat takes place when both air flows are led through the heat exchanger. The discharged air may be cooled to a temperature very near freezing by the cold air entering the unit from outside. In this case, the unit will regularly open the frost valve and take in warm air from the home. This warm air is mixed with the cold air that is taken in from outside. The temperature of the intake air is, therefore, higher and the discharge air in the heat exchanger will also be safely above freezing. The unit will thus not freeze.

Balancing the air flow

In a balanced ventilation system the volume of air coming from outside equals the amount of air discharged from the home. The outside air suction fan, therefore, turns faster when the frost protection is triggered. Thus, the volume of air coming from outside remains the same as the amount of air discharged from the home. The total volume of air intake increases proportionally with the volume of air taken in from the home by the frost valve. Opening the frost valve is not sufficient when the outside temperature is even lower. The intake fan will turn more slowly and, after some time, the discharge ventilator will turn faster. The air, therefore, remains above freezing. This results in a temporary imbalance of the ventilation (the volume of air coming from outside is no longer equal to the amount of air discharged from the home). When the outside temperature increases, the unit automatically resets the fans to the initial values. The ventilation is thus once again balanced.

4.3 Electronic components

The electronic components are important parts of the unit. The electronic components control the operation of the unit when you set the mode switch. The motor is set to the speed that ensures the desired ventilation. The electronic components consist of a basic printed circuit board and an optional radio frequency module. This can be used to extend the ventilation unit with radio frequency operation.
The user should not touch the electronic components. These components may be live.

5.1 Grilles

The volume of air that has to be extracted is specified in the Building Regulations. The volume of air flowing into the home has to be in balance with the extracted volume. The volume of air extracted from and supplied to the home should, in other words, be equal. The minimum air volume per room is also determined by the Building Regulations. The set volume of air is determined based on achieving an optimum home climate without wasting energy. The air intake and discharge per room are not equal. The extraction and intake grilles all have their own fixed positions and settings.

Extraction/Intake Grilles grilles

ELF

The setting of the grilles should not be changed. Changing the settings may disrupt the operation of the complete ventilation system. Grilles and valves should not be switched with each other.

The HRU ECO 4 “Combiflow” system has been designed to recover as much heat as possible and to function well using as little energy as possible.

The Itho HRU ECO 4 can be operated using a radio frequency operation switch.

RF operation switch

Radio frequency (RF) operation switch

The RF (radio frequency) operation switch (transmitter) can be used as a 3-position mode switch with timer feature for the HRU ECO 4 ventilation unit. This operation switch can be used to set the ventilation unit to one of the three ventilation modes (capacities):
The modes are:

Mode 1 - Low mode
Mode 2 - Medium mode
Mode 3 - High mode

The low mode is used at night, the medium mode during the day when there are people at home and the high mode when cooking, showering or bathing.

The switch also has a timer

The ventilation unit can be switched to high mode for a predetermined time by pressing the timer button.
The timer automatically switches the ventilation unit to low mode after the time has elapsed.

The length of time set for the timer is determined by the user.
Press the timer button once to set the ventilation unit to high mode for 10 minutes.
Press the timer button twice to set the ventilation unit to high mode for 20 minutes.
Press the timer button three times to set the ventilation unit to high mode for 30 minutes.

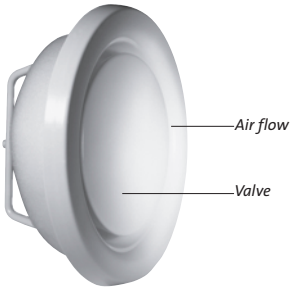
If the operation switch is used by choosing mode 1, 2 or 3 while the timer is in operation, the timer is switched off and the ventilation unit operates in the chosen mode.

Recommended hours of operation

To guarantee a healthy environment in your home we recommend the following daily hours of operation for the ventilation system:

At most 14 hours in low mode
At least 8 hours in medium mode
At least 2 hours in high mode

A new home contains approximately 2000 litres of moisture in its floors and walls. This moisture has to be removed from the home. It is recommendde that a new home be ventilated more intensively during the first few months. For example, by setting the ventilation system to medium mode instead of low mode during the recommended hours of operation provided in the above list.



Grilles

The grilles have to be cleaned regularly to ensure the constant and reliable operation of the ventilation system and for your own health. Make sure that the setting of the system (air flow) is not changed when you clean the grilles. The valve could be turned by accident and this would mean that the opening becomes larger or smaller. Each grille should be placed back in the same duct opening in the same room from which it was removed.

Filters

The heat recovery unit and the extractor have filters. The filters prevent the contamination of the ventilation, guarantee years of correct operation and ensure that clean air is blown into your home. This is very important for your health. Check and clean the filters regularly (a few times a year) and replace the filters when necessary. This ensures the home is ventilated sufficiently at all times. The filters can be cleaned manually by washing them.

Cleaning grilles without filters

Grilles without filters can be taken out of the duct opening (twist to the left). Before you clean the grille in warm water (with detergent), remove the foam plastic ring. After cleaning, the grille can be replaced in the duct opening with a twist to the left. Always make sure you replace a grille in the same room.

The filters

For the user, maintenance is limited to cleaning the filters. In order to safeguard the proper functioning of the unit, the filters will have to be cleaned or replaced regularly. The table below indicates the average terms for maintenance or replacement of the filters. This may differ per situation. The unit comes with standard G3 filters. Up to half a year after the delivery of the house, the filters will have to be cleaned once a month. After this, the filters will have to be replaced.

Filter	Clean	Replace
G3	Every 3 months	Once a year
G4	Every 9 months	Once every 1.5 years
F7	Every 7 months	Once a year

Replace the filters in this order:

- Take the power cable out of the socket
- Pull the filter holders out of the unit
- Remove the old filter from the filter holder
- Clean the old filter or take the new one from
- the packaging (filters can be cleaned with a vacuum cleaner)
  Place the new filter in the filter holder
- put the power cable back in the socket

Insect filter

Once a year, the insect filter must be cleaned. The occupant can do this him / herself. First, remove the power cable. Remove the yellow cap at the top of the unit. Now insert the nozzle of the vacuum cleaner into the hole and turn on the vacuum cleaner. This way the vacuum cleaner removes any mosquitoes and suchlike present. Replace the yellow cap and switch the unit on again.

Removing the front of the unit

You can order new filter sets for the HRU ECO 4 from Itho Ventilation Limited.

Condensation discharge

The warm contaminated air passes along the colder fresh outside air in the heat exchanger of the heat recovery unit. These air flows are completely separated. Condensation often results. The HRU ECO 4 has a condensation discharge to drain the condensation. This discharge has a PVC coupling with a 40 mm external diameter. The installer connects this coupling of the heat recovery unit to the house sewerage using a separate removable rubber coupling.

An air trap with a minimum level difference of 250 mm is added in this connection. Above the air trap, a branch pipe is mounted at a 45-degree angle. This branch pipe has a cover with a rubber ring. This can be opened to easily top up the water trap. This is required to maintain or restore the water trap.

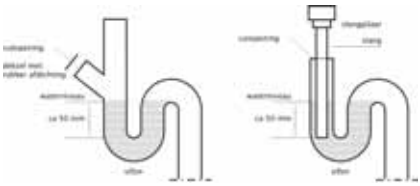
Fixed coupling with fill opening

If the air trap runs dry, the air from the house sewerage will be able to enter through the unit and be discharged outside by the discharge ventilator. No smell will be caused but the discharge capacity will decrease. We recommend refilling the air trap quarterly. The water will evaporate more quickly in summer.

Smells near the coupling with the condensation discharge hose

When the air trap runs dry, a direct connection with the house sewerage is created. This creates smells. Refill the air trap using the fill opening to solve the problem. Effective discharge of cooking and baking vapours in the kitchen is guaranteed by the extractor. The extractor is connected to the balanced ventilation system.

It is preferable to have a registered installer carry out the cleaning.



The Itho HRU ECO 4 warranty is valid for 2 years after production date. The production date is indicated on the type plate.

The warranty does not apply to:

- disassembly and assembly costs
- faults which are, in our opinion, caused by incorrect treatment, negligence or an accident
- faults that have been caused by repairs or intended repairs by third parties without our authorisation.
- faults caused by irregular and / or incompetent maintenance.

Should the unit become damaged or malfunction, switch it off, isolating it from the mains supply, and contact Itho Ventilation immediately.

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Warranty card

The warranty is only valid if the warranty card was filled in by your supplier on the date of installation and if it is sent along with any request for repair (a receipt including the date of installation is also acceptable). This warranty card should be filled in on the installation date and be kept by the user.

Type

Serial number

Voltage

Installation date

Supplier seal

Manufacturer's statement

EU Declaration of Conformity (Low Voltage Directive 73/23/EEC)

Itho B.V., Adm. de Ruyterstraat 2, 3115 HB Schiedam, The Netherlands, declares that the product "Itho heat recovery unit HRU ECO 4", to which this declaration applies, is intended to be built into a machine/installation or assembled together with other machines to create a single machine or installation to which the Machinery Directive applies.

The product is designed to be integrated into a ventilation system. The Machine Directive states that it may only be put into operation once the complete installation conforms to the requirements of the European Union directives. The most important instructions to meet these requirements are included in this manual.

P.S. Please note that the CE certification on the device only applies to the Low Voltage Directive 73/23/EEC.
After submission of Annex IIA of the Machinery Directive for the entire installation, the CE certification on the machine indicates that the system conforms to the Machine Directive 89/392/EEC as amended by 91/368/EEC, 93/44/EEC and 93/68/EEC.

The Netherlands, November 2005

J. Rijnbeek
Business Unit Manager
Businessunit Woningventilatie Projecten

EU Declaration of Conformity

(according to Annex IIA of the Machinery Directive) (89/392/EEC as amended by 91/368/EEC, 93/44/EEC and 93/68/EEC)

The installer: ..... (name installer)

.....(full address and country)

.....

.....

.....

declares to have built the Itho heat recovery unit HRU ECO 4 fan into a ventilation installation to which this declaration applies. Therefore the entire installation (as a single machine) conforms to the Machine Directive.

Town : .....

Date : .....

Name : .....

Job position : .....

Signature : .....

Problem		Troubleshooting
Fans do not turn	No power supply	Mains voltage failure. Wall socket power supply failure. Check the distribution board in the fuse cabinet/meter cupboard. Check whether the 230 Volt plug is placed correctly in the unit.
Intake fan does not turn.	Little or no air is coming through the intake grilles.	Frost protection is activated. Clean the filters.
Discharge fan does not turn.	No suction through the discharge grilles.	Clean the filters.
Low volume of intake air.	Low volume of air through intake grilles.	Clean the filters. Exchanger is partially frozen shut (frost protection failure).
Low volume of discharge air.	Low volume of air to discharge grilles.	Clean the filters. Exchanger is partially frozen shut (frost protection fault).
Condensation leakage.	Drops of water on bottom of the unit.	Condensation discharge is clogged. Leaking condensation discharge.
Unpleasant smell	Near the unit. Near intake grilles.	Air trap under the unit is dry. Distance between outside air suction and ventilation outlet is too small.
Noise	Swishing sound from the air flow.	The duct system is creating too much resistance. Valves are not opened sufficiently. Valves do not fit the duct properly. Too much resistance due to contamination of filters or exchanger (frozen).
	Rattling noise.	Fan does not run true or is faulty.
	Gurgling noise.	The air trap is dry. Condensation discharge is not sufficiently deep in the air trap.

If the problem persists, report the details to the installer!

Energy-efficient climate control systems that add to your comfort. Itho proves it can be done.

Wherever you live or work, there's a good chance that you will come into contact with Itho products and services in the coming months and years in the UK.

After all, we develop climate systems for all those places where people are active; from homes to offices; restaurants and hotels.

The residents, occupants and owners of all of these buildings ultimately always demand the same two things. On the one hand, they want the highest possible level of comfort. On the other hand, they also want the lowest possible energy consumption. At first glance, these would appear to be conflicting demands.

At Itho, we have made it our goal to prove that these two demands can actually go hand in hand. We have the professional skills, drive and innovative strength necessary to actually provide the proof: with statistics, test results and mostly, satisfied and enthusiastic clients and users.

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